

Claims

1. A method to support a reduced resource dormant state for packet data, the method comprising:
 - 5 maintaining session context information for a mobile station (MS);
forwarding data for the MS to a packet control function (PCF) via a tunnel;
releasing the tunnel and a portion of the session context information to support a reduced resource dormant state;
 - 10 receiving new data for the MS after releasing the tunnel;
in response to receiving new data for the MS, sending a reconnection request to the PCF for establishment of a new tunnel; and
forwarding the new data to the PCF via the new tunnel.
- 15 2. The method of claim 1, wherein releasing the tunnel and a portion of the session context information comprises releasing the tunnel and a portion of the session context information after a period of MS session inactivity.
- 20 3. The method of claim 1, wherein the session context information comprises session information from the group consisting of MIP tunnel binding, mobile-identifier-to-IP-address mapping, PPP context, PCF address, and A10 tunnel mapping.
- 25 4. The method of claim 3, wherein the mobile-identifier-to-IP-address mapping comprises a MIN-to-IP address mapping.
5. The method of claim 3, wherein the mobile-identifier-to-IP-address mapping comprises an IMSI-to-IP address mapping.

6. The method of claim 1, wherein releasing the tunnel and a portion of the session context information comprises releasing at least a portion of maintained PPP context information.
- 5 7. The method of claim 6, wherein releasing the tunnel and a portion of the session context information comprises releasing all maintained PPP context information.
8. The method of claim 1, wherein releasing the tunnel and a portion of the session context information comprises releasing a PCF address.
- 10 9. The method of claim 1, wherein releasing the tunnel and a portion of the session context information comprises releasing an A10 tunnel mapping.
- 15 10. The method of claim 1, wherein sending the reconnection request comprises sending an A11 Reconnection Request message.
- 20 11. The method of claim 1, further comprising receiving a reconnection response from the PCF in response to sending the reconnection request to the PCF.
12. The method of claim 11, wherein receiving the reconnection response comprises receiving an A11 Reconnection Response message.
- 25 13. The method of claim 1, further comprising establishing a new PPP session with the MS in response to receiving new data for the MS.

14. A packet data serving node (PDSN) able to support a reduced resource dormant state for packet data, the PDSN comprising:

 - a network interface; and
 - a processor, communicatively coupled to the network interface,
 - adapted to maintain session context information for a mobile station (MS),
 - adapted to forward data for the MS to a packet control function (PCF) via the network interface and a tunnel,
 - adapted to release the tunnel and a portion of the session context information to support a reduced resource dormant state,
 - adapted to send a reconnection request for establishment of a new tunnel, wherein the reconnection request is sent to the PCF via the network interface after releasing the tunnel and in response to receiving new data for the MS, and
 - adapted to forward the new data to the PCF via the network interface and the new tunnel.

15. A method to support a reduced resource dormant state for packet data, the method comprising:
 - maintaining session resources for a mobile station (MS);
 - receiving data for the MS from a packet data serving node (PDSN)
- 5 via a tunnel;
 - after a period of MS session inactivity, releasing the tunnel and the session resources;
 - receiving a reconnection request from the PDSN for establishment of a new tunnel; and
- 10 receiving new data for the MS from the PDSN via the new tunnel.
16. The method of claim 15, wherein releasing the tunnel and the session resources after a period of MS session inactivity comprises releasing the tunnel and the session resources after a predetermined period of MS dormancy elapses.
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17. The method of claim 15, further comprising sending a reconnection response to the PDSN in response to receiving the reconnection request from the PDSN.
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18. The method of claim 17, wherein sending the reconnection response comprises sending an A11 Reconnection Response message.
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19. The method of claim 17, wherein sending the reconnection response comprises sending the reconnection response to indicate that the reconnection request is being serviced.
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20. The method of claim 15, further comprising requesting a base site controller (BSC) to initiate paging of the MS in response to receiving the reconnection request from the PDSN.
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21. The method of claim 20, wherein requesting a base site controller (BSC) to initiate paging of the MS comprises sending an A9-BS Service Request message to the BSC.
- 5 22. The method of claim 15, further comprising requesting the PDSN to setup the new tunnel.

23. A packet control function (PCF) able to support a reduced resource dormant state for packet data, the PCF comprising:

 - a network interface; and
 - a processor, communicatively coupled to the network interface,
 - adapted to maintain session resources for a mobile station (MS),
 - adapted to receive data for the MS from a packet data serving node (PDSN) via a tunnel,
 - adapted to release the tunnel and the session resources after a period of MS session inactivity,
 - adapted to receive a reconnection request from the PDSN for establishment of a new tunnel, and
 - adapted to receive new data for the MS from the PDSN via the new tunnel.

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24. The PCF of claim 23, wherein the tunnel comprises an A10 Tunnel and wherein the new tunnel comprises an A10 Tunnel.